

General

Guideline Title

Diagnosis of stable ischemic heart disease: summary of a clinical practice guideline from the American College of Physicians/American College of Cardiology Foundation/American Heart Association/American Association for Thoracic Surgery/Preventive Cardiovascular Nurses Association/Society of Thoracic Surgeons.

Bibliographic Source(s)

Qaseem A, Fihn SD, Williams S, Dallas P, Owens DK, Shekelle P, Clinical Guidelines Committee of the American College of Physicians. Diagnosis of stable ischemic heart disease: summary of a clinical practice guideline from the American College of Physicians/American College of Cardiology Foundation/American Heart Association/American Association for Thoracic Surgery [trunc]. *Ann Intern Med.* 2012 Nov 20;157(10):729-734. [129 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Definitions for the strength of evidence (high, moderate, low, or insufficient evidence to determine net benefits or risks) and strength of recommendations (strong, weak) are defined at the end of the "Major Recommendations" field.

In interpreting these recommendations, it is important to distinguish between the probability of having ischemic heart disease (IHD) and the probability (risk) of death or myocardial infarction once the diagnosis of IHD is established.

Initial Cardiac Testing to Establish Diagnosis of Ischemic Heart Disease

Recommendation 1: The organizations recommend that patients with chest pain should receive a thorough history and physical examination to assess the probability of IHD prior to additional testing (Grade: strong recommendation; low-quality evidence).

Recommendation 2: The organizations recommend that choices regarding diagnostic and therapeutic options should be made through a process of shared decision making involving the patient and provider, explaining information about risks, benefits, and costs to the patient (Grade: strong recommendation; low-quality evidence).

Recommendation 3: The organizations recommend that patients who present with acute angina must be categorized as stable or unstable; patients with unstable angina should be further categorized as high, moderate, or low risk (Grade: strong recommendation; low-quality evidence).

Recommendation 4: The organizations recommend a resting electrocardiography (ECG) in patients without an obvious noncardiac cause of chest pain for risk assessment (Grade: strong recommendation; moderate-quality evidence).

Recommendation 5: The organizations recommend standard exercise ECG for initial diagnosis in patients with an intermediate pretest probability of IHD who have an interpretable ECG and at least moderate physical functioning or no disabling comorbidity (Grade: strong recommendation; high-quality evidence).

Recommendation 6: The organizations recommend that exercise stress with radionuclide myocardial perfusion imaging or echocardiography should be used for patients with an intermediate to high pretest probability of IHD that have an uninterpretable ECG and at least moderate physical functioning or no disabling comorbidity (Grade: strong recommendation; moderate-quality evidence).

Recommendation 7: The organizations recommend that pharmacologic stress with radionuclide myocardial perfusion imaging, echocardiography, or cardiac magnetic resonance imaging should not be used for patients who have an interpretable ECG and at least moderate physical functioning or no disabling comorbidity (Grade: strong recommendation; low-quality evidence).

Recommendation 8: The organizations recommend that exercise stress with nuclear myocardial perfusion imaging should not be used as an initial test in low-risk patients who have an interpretable ECG and at least moderate physical functioning or no disabling comorbidity (Grade: strong recommendation; low-quality evidence).

Recommendation 9: The organizations recommend pharmacologic stress with radionuclide myocardial perfusion imaging or echocardiography for patients with an intermediate to high pretest probability of IHD who are incapable of at least moderate physical functioning or with disabling comorbidity (Grade: strong recommendation; moderate-quality evidence).

Recommendation 10: The organizations recommend that standard exercise ECG testing should not be used for patients that have an uninterpretable ECG or are incapable of at least moderate physical functioning or with disabling comorbidity (Grade: strong recommendation; low-quality evidence).

Recommendation 11: The organizations recommend assessing resting left ventricular systolic and diastolic ventricular function and evaluating for abnormalities of myocardium, heart valves, or pericardium using Doppler echocardiography in patients with known or suspected IHD and a prior myocardial infarction, pathologic Q waves, symptoms or signs suggestive of heart failure, complex ventricular arrhythmias, or an undiagnosed heart murmur (Grade: strong recommendation; moderate-quality evidence).

Recommendation 12: The organizations recommend that echocardiography, radionuclide imaging, cardiac magnetic resonance imaging, or cardiac computed tomography should not be used for routine assessment of left ventricular function in patients with a normal ECG, no history of myocardial infarction, no symptoms or signs suggestive of heart failure, and no complex ventricular arrhythmias (Grade: strong recommendation; low-quality evidence).

Recommendation 13: The organizations recommend that routine reassessment (<1 year) of left ventricular function using technologies such as echocardiography radionuclide imaging, cardiac magnetic resonance imaging, or cardiac computed tomography should not be used in patients with no change in clinical status and for whom no change in therapy is contemplated (Grade: strong recommendation; low-quality evidence).

Cardiac Stress Testing to Assess Risk in Patients with Known Stable IHD Who Are Able to Exercise

Recommendation 14: The organizations recommend standard exercise ECG testing for risk assessment in patients who are able to exercise to an adequate workload and have an ECG that can be interpreted during exercise (Grade: strong recommendation; moderate-quality evidence).

Recommendation 15: The organizations recommend the addition of either radionuclide myocardial perfusion imaging or echocardiography to standard exercise ECG testing for risk assessment, in patients with stable IHD who are able to exercise to an adequate workload but have an uninterpretable ECG not due to left bundle branch block or ventricular pacing (Grade: strong recommendation; moderate-quality evidence).

Recommendation 16: The organizations recommend that pharmacologic stress imaging (radionuclide myocardial perfusion imaging, echocardiography, cardiac magnetic resonance imaging) or cardiac computed tomography angiography should not be used for risk assessment in patients with stable IHD who are able to exercise to an adequate workload and have an interpretable ECG (Grade: strong recommendation; low-quality evidence).

Cardiac Stress Testing to Assess Risk in Patients with Known Stable IHD Who Are Unable to Exercise

Recommendation 17: The organizations recommend pharmacologic stress with either radionuclide myocardial perfusion imaging or echocardiography for risk assessment in patients who are unable to exercise to an adequate workload regardless of interpretability of ECG (Grade: strong recommendation; moderate-quality evidence).

Cardiac Stress Testing to Assess Risk in Patients with Stable IHD Regardless of Ability to Exercise

Recommendation 18: The organizations recommend pharmacologic stress with either radionuclide myocardial perfusion imaging or echocardiography for risk assessment in patients with stable IHD who have left bundle branch block on ECG, regardless of ability to exercise to an adequate workload (Grade: strong recommendation; moderate-quality evidence).

Recommendation 19: The organizations recommend either exercise or pharmacological stress with imaging (radionuclide myocardial perfusion imaging, echocardiography, or cardiac magnetic resonance) for risk assessment in patients being considered for revascularization of known coronary stenosis of unclear physiologic significance (Grade: strong recommendation; moderate-quality evidence).

Recommendation 20: The organizations recommend that a) more than 1 stress imaging study or b) a stress imaging study and cardiac computed tomography angiography at the same time should not be used for risk assessment in patients with stable IHD (Grade: strong recommendation; low-quality evidence).

Coronary Angiography as an Initial Testing Strategy to Assess Risk in Patients with Stable IHD

Recommendation 21: The organizations recommend that patients with stable IHD who have survived sudden cardiac death or potentially life-threatening ventricular arrhythmia undergo coronary angiography to assess cardiac risk (Grade: strong recommendation; moderate quality-evidence).

Recommendation 22: The organizations recommend that patients with stable IHD who develop symptoms and signs of heart failure should be evaluated to determine whether coronary angiography should be performed for risk assessment (Grade: strong recommendation; moderate quality-evidence).

Recommendation 23: The organizations recommend that patients with stable IHD and clinical characteristics that indicate a high likelihood of severe IHD should undergo coronary angiography to assess cardiac risk (Grade: strong recommendation; low-quality evidence).

Coronary Angiography to Assess Risk after Initial Workup with Noninvasive Testing

Recommendation 24: The organizations recommend that coronary arteriography should be used for risk assessment in patients with stable IHD whose clinical characteristics and results of noninvasive testing indicate a high likelihood of severe IHD and when the benefits are deemed to exceed risk (Grade: strong recommendation; low-quality evidence).

Recommendation 25: The organizations recommend that coronary angiography for risk assessment should not be utilized for stable IHD patients who elect not to undergo revascularization or who are not candidates for revascularization based on comorbidities or individual preferences (Grade: strong recommendation; moderate-quality evidence).

Recommendation 26: The organizations recommend that coronary angiography should not be used to further assess risk in patients with stable IHD who have preserved left ventricular function (ejection fraction >50%) and low-risk criteria on noninvasive testing (Grade: strong recommendation; moderate-quality evidence).

Recommendation 27: The organizations recommend that coronary angiography should not be used to assess risk in patients who are at low risk based upon clinical criteria and who have not undergone noninvasive risk testing (Grade: strong recommendation; low-quality evidence).

Recommendation 28: The organizations recommend that coronary angiography should not be used to assess risk in asymptomatic patients with no evidence of ischemia on noninvasive testing (Grade: strong recommendation; low-quality evidence).

Definitions:

The American College of Physicians' Guideline Grading System*		
Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced with Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

Clinical Algorithm(s)

The following clinical algorithms are provided in the original guideline document:

- Diagnosis of Patients Suspected of Having Ischemic Heart Disease
- Risk Assessment of Patients with Stable Ischemic Heart Disease

Scope

Disease/Condition(s)

Stable ischemic heart disease

Guideline Category

Diagnosis

Evaluation

Risk Assessment

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Nursing

Radiology

Thoracic Surgery

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To synthesize the evidence for the following key questions:

- How should a clinician evaluate a patient with chest pain that is consistent with ischemic heart disease (IHD)?
- What is the role of noninvasive testing in the diagnosis of stable IHD?

Target Population

All adult patients with stable known or suspected ischemic heart disease

Interventions and Practices Considered

1. History and physical examination to assess the probability of ischemic heart disease prior to additional testing
2. Shared decision making between provider and patient on diagnostic and therapeutic options
3. Comprehensive clinical assessment of risk (low, intermediate, high) and whether patient has stable or unstable angina
4. Resting electrocardiography (ECG)
5. Standard exercise ECG
6. Exercise stress with radionuclide myocardial perfusion imaging or echocardiography
7. Pharmacologic stress with radionuclide myocardial perfusion imaging, echocardiography, or cardiac magnetic resonance imaging
8. Assessing resting left ventricular systolic and diastolic ventricular function and evaluating for abnormalities of myocardium, heart valves, or pericardium using Doppler echocardiography
9. Computed coronary tomography angiography (CCTA)

Major Outcomes Considered

- Mortality
- Hospitalizations
- Invasive procedures
- Emergency department visits
- Long-term care
- Cardiac events, e.g., myocardial infarction and unstable angina

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The databases used for the literature search included MEDLINE, Embase, Cochrane CENTRAL, PsychINFO, AMED, and SCOPUS for studies published up until November 2011. The criteria for search included human participants and English-language articles. For more details on the methods, please refer to the American College of Cardiology Foundation (ACCF), American Heart Association (AHA), American College of Physicians (ACP), American Association for Thoracic Surgery (AATS), Preventive Cardiovascular Nurses Association (PCNA), Society for Cardiovascular Angiography and Interventions (SCAI), and Society of Thoracic Surgeons (STS) guideline for the diagnosis and management of patients with stable ischemic heart disease (see the "Adaptations" field).

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

This guideline grades the evidence and recommendations according to a translation of the American College of Cardiology Foundation (ACCF)/American Heart Association (AHA) grading system into the American College of Physicians' (ACP's) clinical practice guidelines grading system. See the "Rating Scheme for the Strength of the Recommendations" field.

Methods Used to Analyze the Evidence

- Review of Published Meta-Analyses
- Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

American College of Physicians (ACP) guideline recommendations are based on evidence from systematic reviews of high-quality evidence (several well-designed randomized, controlled trials) and meta-analyses where appropriate. Because these guidelines are based on the joint guideline, the ACP translated the American College of Cardiology Foundation (ACCF)/American Heart Association (AHA) evidence and recommendation grades into ACP's guideline grading system (see the "Rating Scheme for the Strength of the Recommendations" field and Table 2 in the original guideline document). The authors included only class I and class III statements from the joint guideline because the evidence for these statements very clearly demonstrates the trade-off between benefits and harms (see Table 2 in the original guideline document). For details on other recommendations, refer to the American College of Cardiology Foundation, American Heart Association, American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons guideline for the diagnosis and management of patients with stable ischemic heart disease (see "Adaptation" field).

Rating Scheme for the Strength of the Recommendations

The American College of Physicians' Guideline Grading System*		
Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced with Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

*Adopted from the classification developed by the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) workgroup.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

These guidelines were approved by the American College of Physicians Board of Regents on April 16, 2012.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate use of diagnostic testing strategies in patients with known or suspected stable ischemic heart disease

Potential Harms

- Clinicians should be aware that the low sensitivity of exercise electrocardiography and stress imaging modalities means that negative test results should be interpreted cautiously.
- Coronary angiography has many limitations in addition to being invasive, risky, and expensive. These include reliability in interpretation issues due to technical quality and interobserver reliability. As an anatomical test, angiography alone in isolation is not a reliable indicator of the functional significance of a given coronary stenosis because it provides only direct anatomical data. It cannot be used to accurately distinguish between plaques that are relatively stable and those that pose an imminent risk for rupture and precipitation of an acute coronary syndrome.

Qualifying Statements

Qualifying Statements

- Clinical practice guidelines are "guides" only and may not apply to all patients and all clinical situations. Thus, they are not intended to override clinicians' judgment. All American College of Physicians' clinical practice guidelines are considered automatically withdrawn or invalid 5 years after publication or once an update has been issued.
- The authors of this article are responsible for its contents, including any clinical or treatment recommendations.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

Mobile Device Resources

Patient Resources

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Qaseem A, Fihn SD, Williams S, Dallas P, Owens DK, Shekelle P, Clinical Guidelines Committee of the American College of Physicians. Diagnosis of stable ischemic heart disease: summary of a clinical practice guideline from the American College of Physicians/American College of Cardiology Foundation/American Heart Association/American Association for Thoracic Surgery [trunc]. *Ann Intern Med.* 2012 Nov 20;157(10):729-734. [129 references] [PubMed](#)

Adaptation

These recommendations are based on the following guideline: Fihn SD, Gardin JM, Abrams J, Berra K, Blankenship JC, Dallas P, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *J Am Coll Cardiol.* 2012.

Date Released

Guideline Developer(s)

American College of Physicians - Medical Specialty Society

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American College of Physicians

Guideline Committee

Clinical Guidelines Committee of the American College of Physicians

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Financial Disclosures/Conflicts of Interest

Any financial and nonfinancial conflicts of interest of the group members were declared, discussed, and resolved according to the American College of Physicians' conflicts of interest policy. A record of conflicts of interest is kept for each Clinical Guidelines Committee meeting and conference call and can be viewed at http://www.acponline.org/clinical_information/guidelines/guidelines/conflicts_cgc.htm

. Author and peer reviewer disclosure information for the multisocietal stable IHD guideline, on which these guidelines are based, may be found in the published multisocietal document. Disclosures can also be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M12-1769 .

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

Availability of Companion Documents

The following are available:

- Qaseem A, Fihn SD, Dallas P, Williams S, Owens DK, Shekelle P, for the Clinical Guidelines Committee of the American College of Physicians. Management of stable ischemic heart disease: summary of a clinical practice guideline from the American College of Physicians/American College of Cardiology Foundation/American Heart Association/American Association for Thoracic Surgery/Preventive Cardiovascular Nurses Association/Society of Thoracic Surgeons. *Ann Intern Med.* 2012;157(10):735-743. Available at the [Annals of](#)

[Internal Medicine Web site](#) .

- Diagnosis of patients with stable ischemic heart disease. Continuing medical education. Available from the [Annals of Internal Medicine Web site](#) .
- Qaseem A, Snow V, Owens DK, Shekelle P. The development of clinical practice guidelines and guidance statements of the American College of Physicians: summary of methods. Ann Intern Med. 2010 Aug 3;153(3):194-199. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

A collection of recommendation summaries for all current American College of Physicians Clinical Guidelines is now available for Personal Digital Assistant (PDA) download from the [American College of Physicians Web site](#) .

Patient Resources

The following is available:

- Summaries for patients. Diagnosis of stable ischemic heart disease: recommendations from the American College of Physicians, American College of Cardiology Foundation, American Heart Association, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, and Society of Thoracic Surgeons. Ann Intern Med. 2012;157(10):I-42. Available at the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

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NGC Status

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